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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/679,109	10/03/2003	Leszek Dariusz Wronski	SYS 051 PA	2270

29673 7590 05/16/2007
STEVENS & SHOWALTER LLP
7019 CORPORATE WAY
DAYTON, OH 45459-4238

EXAMINER	
MIRZADEGAN, SAEED S	

ART UNIT	PAPER NUMBER
2109	

MAIL DATE	DELIVERY MODE
05/16/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

PTOL-90A (Rev. 04/07)

14

Office Action Summary	**Application No.** 10/679,109	**Applicant(s)** WRONSKI ET AL.	
	Examiner Saeed S. Mirzadegan	**Art Unit** 2109	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 October 2003*.
2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.
3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-23* is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5)☐ Claim(s) _____ is/are allowed.
6)☒ Claim(s) *1-23* is/are rejected.
7)☐ Claim(s) _____ is/are objected to.
8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.
10)☒ The drawing(s) filed on *10/03/2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a)☐ All b)☐ Some * c)☐ None of:
1.☐ Certified copies of the priority documents have been received.
2.☐ Certified copies of the priority documents have been received in Application No. _____.
3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 1-9-04
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement (IDS) submitted on 2/12/2004 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Specification

2. The disclosure is objected to because of the following informalities: Page 11, Line 12, Recites "nodes that are distances up through N from the given node can be determined by using ". It should read "nodes that are distances one through N from the given node can be determined by using".

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention

3. Dependent **Claims 2 & 9** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. Regarding dependent **claim 2**, the phrase "approximately" renders the claim indefinite. The term "approximately" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably appraised of the scope of the invention. The periodical transmittal frequency has been rendered indefinite by use of the aforementioned term. Given the indefinite nature of this claim, the examiner reasonably understands the periodical transmittal frequency to be any frequency smaller than 1 second.

5. Dependent **Claim 9** recites the limitation "said node statuses " page 17, line 10. There is insufficient antecedent basis for this limitation in the claim.

6. Insofar as best understood, the claims are rejected over prior art as follows. For the sake of applying the closest prior art below, the term "node statuses" is being interpreted as meaning "knowledge of their immediate neighbors". If the applicant agrees with this interpretation they are invited to amend the claims to positively recite, "knowledge of their immediate neighbors" or if the applicant disagrees, the applicant should present an alternate interpretation with clear arguments.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

7. Independent **Claim 23** is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

The claims lack the necessary physical articles or objects to constitute a machine or a manufacture within the meaning of 35 USC 101. They are clearly not a series of steps or acts to be a process nor are they a combination of chemical compounds to be a composition of matter. As such, they fail to fall within a statutory category. They are, at best, functional descriptive material *per se*.

Descriptive material can be characterized as either "functional descriptive material" or "nonfunctional descriptive material." Both types of "descriptive material" are nonstatutory when claimed as descriptive material *per se*, 33 F.3d at 1360, 31 USPQ2d at 1759. When functional descriptive material is recorded on some computer-readable medium, it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized. Compare *In re Lowry*, 32 F.3d 1579, 1583-84, 32 USPQ2d 1031, 1035 (Fed. Cir. 1994)
Merely claiming nonfunctional descriptive material, i.e., abstract ideas, stored on a computer-readable medium, in a computer, or on an electromagnetic carrier signal, does not make it statutory. See *Diehr*, 450 U.S. at 185-86, 209 USPQ at 8 (noting that the claims for an algorithm in *Benson* were unpatentable as abstract ideas because "the sole practical application of the algorithm was in connection with the programming of a general purpose computer.").

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. **Claims 1-3** are rejected under 35 U.S.C. 102(e) as being anticipated by Pegrum et al. (US Patent No. 6490244 B1, hereafter "Pegrum et al.").

9. Regarding independent **Claim 1**, Pegrum et al. disclose, a network **(a network as shown in FIG. 1, col. 2, lines 43-44)** having a plurality of nodes **(multiple links that connect nodes (routing entities) to each other, col. 2, lines 44-45)** comprising: generating status messages at each node of said network **(periodic broadcast of messages, col. 3, lines 43-46)**, said status messages each including at least a node identification and a message age **(the message includes an originator ID and a node counter field, col. 3, lines 47-48)**; periodically transmitting said status messages from each node of said network **(periodic broadcast of messages from each node col. 3, line 45)**; receiving said status messages at each node of said network **(messages being read at each receiving node, col. 3, lines 55-56)**; aging said status messages at each node of said network **(each node receiving the message changes the node counter field by one increment, col. 3, lines 49-50)**; and retransmitting said aged status messages at each node of said network **(incremented messages at the receiving node being forwarded to the next node, col. 3, lines 48-50)**.

10. For the sake of applying the closest prior art below, the term "approximately 1 ms" is being interpreted as meaning "any length of time less than 1 sec." If the applicant agrees with this interpretation they are invited to amend the claims to positively recite "less than 1 sec" or if the applicant disagrees, the applicant should present an alternate interpretation with clear arguments.

11. Regarding dependent **Claim 2**, Pegrum et al. disclose, periodically transmitting said status messages from each node of said network **(periodic broadcast of messages, col. 3, lines 43-46)** is performed approximately once every millisecond **(message may be sent out every 500 ms., col. 3, line 46)**.

12. Regarding dependent **Claim 3**, Pegrum et al. disclose, periodically transmitting said status messages from each node of said network **(periodic broadcast of messages, col. 3, lines 43-46)** is automatically performed by network logic **(sending status messages to neighboring nodes is done automatically by the lower layer logic, col. 3, lines 36-39)**.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in Graham v. John Deere Co., 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.

2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

13. **Claim 4** is rejected under 35 U.S.C. 103(a) as being unpatentable over Pegrum et al. as applied to claim~~s~~ 1 above, and in view of Rosborough (US Patent No. 5838920, hereafter referred to as "Rosborough").

14. Pegrum et al. disclose, receiving said status messages at each node of said network **(messages being read at each receiving node, col. 3, lines 55-56)**;

15. Regarding dependent **Claim 4** Pegrum et al. do not teach, connecting at least one node within said network as a monitor node; and monitoring said network using said status messages received by said at least one monitor node.

16. In the same field of endeavor, Rosborough teaches, a monitoring node (COMPUTER) **(36, FIG. 1)** for identifying a status messages (transaction) that includes at least a portion of plurality of packets **(col. 3, lines 10-11)**.

17. It would have been obvious to one of ordinary skill in the art at the time of applicant's invention to combine Pegrum et al. with Rosborough since having a node as

monitoring station fulfills the need for having an apparatus to monitor different network parameters based on the content of status messages (packets).

18. The benefit of monitoring the network parameters is, knowing how different elements affect network performance and how to compensate for them to achieve optimum performance.

19. **Claim 5-7** are rejected under 35 U.S.C. 103(a) as being unpatentable over Pegrum et al. as applied to claims 1 above, and in view of Meares et al. (US Patent No. 6157651, hereafter referred to as "Meares et al.").

20. Regarding dependent **Claim 5** Pegrum et al. do not teach removing status messages from said network at nodes having the same node identifications as said status messages.

21. In the same field of endeavor, Meares et al. teach, the Recipient node, recognizing the status message (data) that has its own node ID, removes the status message (data) from the network (ring) **(col. 1, lines 43-45)**.

22. It would have been obvious to one of ordinary skill in the art at the time of applicant's invention to combine Pegrum et al. with Meares et al. since removing the

message whose ID matches the recipient station's ID prevents messages from loop in the network continuously.

23. The benefit of preventing messages from continuously looping on the network is that additional bandwidth would free up so more messages can be sent to the recipients there by increasing the usable bandwidth and performance of the network.

24. Regarding dependent **Claim 6**, Pegrum et al. disclose, using the age of status messages removed by each node as a node age **(the receiving node learns the distance from the originator by the value of the counter field, col. 3, lines 55-57)**.

25. Regarding dependent **Claim 7**, Pegrum et al. disclose, determining the size of said network based on said node age **(the receiving node learns the distance from the originator by the value of the counter field, col. 3, lines 55-57).**

26. **Claim 8** is rejected under 35 U.S.C. 103(a) as being unpatentable over Pegrum et al. and Meares et al. as applied to claims 7 above, and in view of Mulla (US Patent No. 5870387, hereafter referred to as "Mulla").

27. Regarding dependent **Claim 8**, Pegrum et al. disclose, aging said status messages comprises incrementing said message age by one **(each node receiving**

the message changes the node counter field by one increment, col. 3, lines 49-50).

28. Regarding dependent **Claim 8** Pegrum et al. and Meares et al. do not teach said message age is set to zero upon generation, the size of said network is equal to the node age plus one.

29. In the same field of endeavor, Mulla teaches, the first node is node 0 (ring master) the next downstream node is node1 and the numbers are incremented around the ring in a linear fashion **(col. 7, lines 14-16)**. The ring master knows how many nodes are present by counting the number of increment messages. If Node 0 (ring master) receives N increment messages, then there are N nodes on the network this includes the message that the ring master itself generated. With out the Node 0's own message, there are N+1 nodes on the network **(col. 7, lines 17-22)**.

30. It would It would have been obvious to one of ordinary skill in the art at the time of applicant's invention to combine Pegrum et al. and Meares et al. with Mulla to determine the size of the network.

31. The benefit of knowing the size of the network is that latency calculations can be made with more precision to calculate the expected arrival of a message also by

knowing the total size of the network the time to live of looped messages can be reduced there by improving the over all performance of the network.

32. **Claim 9** is rejected under 35 U.S.C. 103(a) as being unpatentable over Pegrum et al. and Meares et al. and Mulla as applied to claims 8 above, and in view of Bermer et al. (US. Pat. No. 6553002B1 hereafter referred to as "Bermer et al.") and in further view of Habetha (US Patent. No. 7031321B2, hereafter referred to as "Habetha").

33. Regarding dependent **Claim 9** Pegrum et al. and Meares et al. and Mulla do not teach storing said node statuses at each node of said network at addresses corresponding to ages associated with said node statuses with said node age corresponding to the highest valid stored node status.

34. In the same field of endeavor, Habetha teaches, in the network according to the invention, node statuses (routing information) are stored in nodes of the network. Node statuses (routing information) are preferably stored in every node in the case of decentralized networks **(col. 1, lines 38-41)**. Bermer et al. further teach, In general, node statuses (routing tables) are stored as binary search trees in the memory of the node (router). Each node in the binary tree is stored in a memory location of the node (router) and may correspond to a bit in the binary representation of the destination address **(Col. 7, lines 8-12)**.

35. It would have been obvious to one of ordinary skill in the art at the time of applicant's invention to combine Pegrum et al. and Meares et al. and Mulla with Habetha and Bermer et al. in order to store the status (node ID) of the node associated with the node count (hop count) in relation to the total number of nodes at each node of the network.

36. The benefit of storing this association in every node is that the network administrator would have an easier job of identifying any node on the network based on the relationship of the stored information knowing fewer numbers of parameters than what is usually required.

37. **Claim 10** is rejected under 35 U.S.C. 103(a) as being unpatentable over Pegrum et al. as applied to claims 1 above, and in view of Habetha.

38. Regarding dependent **Claim 10** Pegrum et al. does not teach storing node statuses from said status messages at each node of said network.

39. In the same field of endeavor, Habetha teaches, in the network according to the invention, node statuses (routing information) are stored in nodes of the network. Node statuses (Routing information) are preferably stored in every node in the case of decentralized networks **(col. 1, lines 38-41)**.

40. It would have been obvious to one of ordinary skill in the art at the time of applicant's invention to combine Pegrum et al. with Habetha since saving the data pertinent to the topology of the network at each node will allow each node to figure out where to send the data in case there is a change in the topology of the network.

41. The benefit of preventing messages from continuously looping on the network is that additional bandwidth would free up so more messages can be sent to the recipients there by increasing the performance of the network.

42. **Claim 11** is rejected under 35 U.S.C. 103(a) as being unpatentable over Pegrum et al. and Habetha as applied to claim 10 above, and in view of Meares et al.

43. Regarding dependent **Claim 11** Pegrum et al. and Habetha do not teach storing node statuses comprises storing a data valid indicator.

44. In the same field of endeavor, Meares et al. teach, currently unused data bits within the control field of the data packet are used as "rogue packet bits", which when not set would indicate data being valid **(col. 4, lines 10-11)**.

45. It would have been obvious to one of ordinary skill in the art at the time of applicant's invention to combine Pegrum et al. and Habetha with Meares et al. to save additional information about the other nodes in the network in each node.

46. The benefit of saving the additional information about the condition of the other nodes on the network in each node is that, each node can reconfigure itself much faster when there is a configuration change in the network.

47. **Claim 12** is rejected under 35 U.S.C. 103(a) as being unpatentable over Pegrum et al. and Habetha as applied to claim 10 above, and in view of Fedyk et al. (US. PG. Pub. No. 2003/0128710A1 hereafter referred to as "Fedyk et al.").

48. Regarding dependent **Claim 12** Pegrum et al. and Habetha do not teach determining the structure of said network from said stored node statuses.

49. In the same field of endeavor, Fedyk et al. teach, in small networks, containing a manageable number of nodes, path selection is accomplished by reference to network structure (topology) information stored at each node in the network. The source node consults its stored network topology information and determines a valid path to the destination node. As the topology of the network is changed, such as by adding or removing nodes, the structure (topology) information at each node in the network is updated **(page 1, [0002] lines 3-11)**.

50. It would have been obvious to one of ordinary skill in the art at the time of applicant's invention to combine Pegrum et al. and Habetha with Fedyk et al. since

storing the structure or topology information in the nodes is a well-known fact in the art as evident by the background information thought by Fedyk et al.

51. The benefit of having the topology information stored in the nodes of the network is the reduction of the difficulty with trouble shooting the problems in the network.

52. **Claim 13** is rejected under 35 U.S.C. 103(a) as being unpatentable over Pegrum et al. and Habetha and Fedyk et al. as applied to claim 12 above, and in view of Mulla.

53. Regarding dependent **Claim 13** Fedyk et al. disclose determining the structure of said network from said stored node statuses.

54. Regarding dependent **Claim 13** Pegrum et al. and Habetha and Fedyk et al. do not teach, said network comprises N nodes: determining a node that is a distance one upstream from a given node by using the node identification of the node status corresponding to an initial message age; and if N>2, determining additional nodes that are distances two through N from said given node by using the node identifications of the node statuses corresponding to said initial message age that has been aged by one through N-1.

55. In the same field of endeavor, Mulla teaches, the first node is node 0 (ring master) the next downstream node is node1 and the numbers are incremented around

the ring in a linear fashion **(col. 7, lines 14-16)**, The ring master knows how many nodes are present by counting the number of increment messages. If Node 0 (ring master) receives N increment messages, then there are N nodes on the network this includes the message that the ring master itself generated. It is simple math that since there are N nodes in the network the nodes distances or hopes 2 to N away from the Node 0 (ring master) would be one through N-1 **(col. 7, lines 17-22)**.

56. It would have been obvious to one of ordinary skill in the art at the time of applicant's invention to combine Pegrum et al. and Habetha and Fedyk et al. with Mulla since knowing the node ID as well as the distance (hops) a node has from another node in the network makes trouble shooting much easier for the network administrator.

57. The benefit of knowing the distance (hop count) of a node from any other node on a network as well as knowing the ID of each of the nodes in question is that any node can easily be located and tended to when required.

58. **Claim 14** is rejected under 35 U.S.C. 103(a) as being unpatentable over Pegrum et al. and Habetha and Fedyk et al. as applied to claim 12 above, and in view of Watanabe (US. Pat. No. 5003533 hereafter referred to as "Watanabe").

59. Regarding dependent **Claim 14** Fedyk et al. disclose, determining the structure of said network from said stored node statuses **(page 1, [0002] lines 3-11)**.

60. Regarding dependent **Claim 14** Pegrum et al. and Habetha and Fedyk et al. do not teach, reading said stored node statuses; identifying an immediately adjacent, first upstream node by the node identification of the node status corresponding to an initial message age; and identifying any additional upstream nodes by the node identifications of the node statuses corresponding to said initial message age that has been aged by said additional upstream nodes.

61. In the same field of endeavor, Watanabe teaches, a function of detecting and receiving (reading) an adjacent station frame (node status) **(col. 2, line 20-21).** Watanabe further teaches identifying an immediately adjacent, first upstream node by the node identification of the node status corresponding to an initial message age (frame); and identifying any additional upstream nodes by the node identifications of the node statuses corresponding to said initial message age that has been aged by said additional upstream nodes **(Fig. 1 and Fig. 2).**

FIG. 1

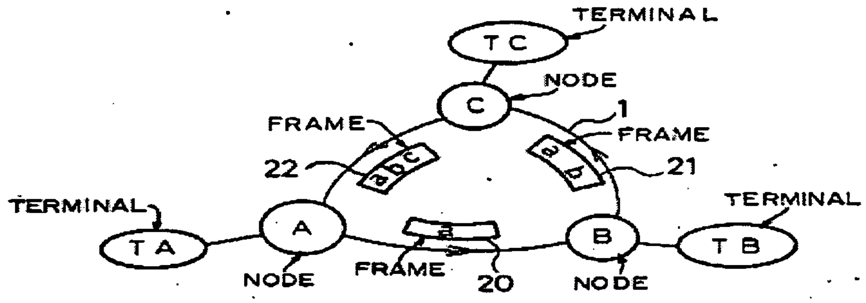
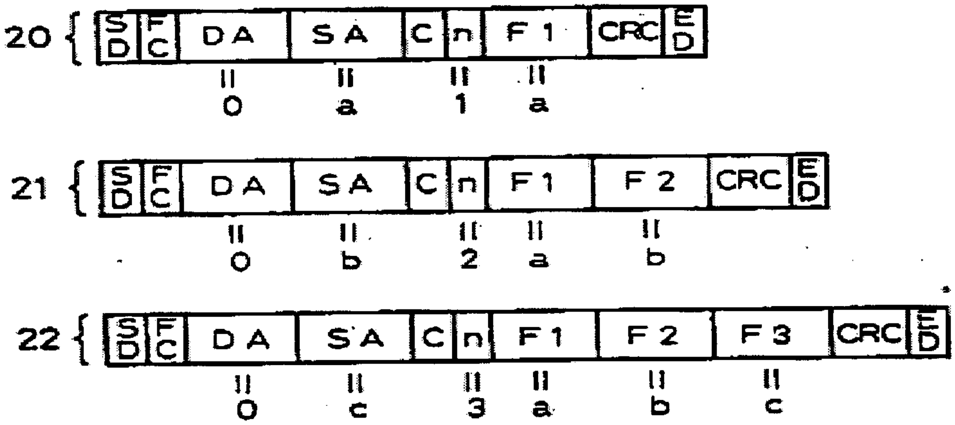


FIG. 2



62. It would have been obvious to one of ordinary skill in the art at the time of applicant's invention to combine Pegrum et al. and Habetha and Fedyk et al. with Watanabe to account for reading the stored information from the memory so as to find the first upstream node as well as identify any additional nodes on the network by their node ID in relation to the hop count parameter of the frame.

63. The benefit of reading the information stored is that once the stored information is read, calculation can be made based on the content of the memory. Unless the stored information is read, the information content is useless. The benefit of knowing the first upstream node as well as any additional nodes in the network by its node ID in relation to the node count is to facilitate the maintenance of the network.

64. **Claim 15** is rejected under 35 U.S.C. 103(a) as being unpatentable over Pegrum et al. and Habetha and Fedyk et al. as applied to claim 12 above, in view of Mulla and in further view of Watanabe.

65. Regarding dependent **Claim 15** Fedyk et al. disclose, determining the structure of said network from said stored node statuses **(page 1, [0002] lines 3-11)**.

66. Regarding dependent **Claim 15** Pegrum et al. and Habetha and Fedyk et al. do not teach, reading said stored node statuses; identifying said network as comprising N nodes where N is the number of node statuses that have been stored and read; identifying an immediately adjacent, first upstream node by the node identification of the node status corresponding to an initial message age; and if N>2, identifying any additional upstream nodes by the node identifications of the node statuses corresponding to said initial message age that has been aged by said additional upstream nodes.

67. In the same field of endeavor, Watanabe teaches, a function of detecting and reading (receiving) an adjacent station node status (frame) **(col. 2, line 20-21)**. Mulla teaches, said network as comprising N nodes where N is the number of node statuses that have been stored and read **(col. 7, lines 14-16)** &**(col. 7, lines 17-22)**. Watanabe further teaches; identifying an immediately adjacent, first upstream node by the node identification of the node status corresponding to an initial message age; and if N>2,

identifying any additional upstream nodes by the node identifications of the node statuses corresponding to said initial message age that has been aged by said additional upstream nodes. **(Fig. 1 and Fig. 2, above).**

68. It would have been obvious to one of ordinary skill in the art at the time of applicant's invention to combine Pegrum et al. and Habetha and Fedyk et al. with Watanabe to account for reading the stored information from the memory in order to calculate the total number of nodes on the network as well as identifying the first node upstream as well as any other node on the network not only by their node ID but also from the hop count from one another derived from the content of the frame.

69. The benefit of reading the information stored is that once the stored information is read, calculation can be made based on the content of the memory. Unless the stored information is read, the information content is useless. Knowing the relative position of the nodes from one another as well as the total number of nodes on a network while knowing the individual node ID's makes the takes of network maintenance substantially easier.

70. **Claim 16** is rejected under 35 U.S.C. 103(a) as being unpatentable over Pegrum et al. and Habetha as applied to claim 10 above, and in view of Bermer et al.

71. Regarding dependent **Claim 16** Habetha discloses storing said node statuses at each node of said network **(col. 1, lines 38-41)**.

72. Regarding dependent **Claim 16** Pegrum et al. and Habetha do not teach, storing said node statuses at each node at addresses corresponding to ages associated with said node statuses.

73. In the same field of endeavor, Bermer et al. teach, In general, node statuses (routing tables) are stored as binary search trees in the memory of the node (router). Each node in the binary tree is stored in a memory location of the node (router) and may correspond to a bit in the binary representation of the destination address **(Col. 7, lines 8-12)**.

74. It would have been obvious to one of ordinary skill in the art at the time of applicant's invention to combine Pegrum et al. and Habetha with Bermer et al. since storing the routing information in the nodes with reference to the node count makes it easier for each node to know exact distance (number of hops) between itself and the other nodes on the network thereby making the routing of data easier.

75. The benefit of saving the routing information at each node with reference to the node count is that the most used routes would be identified much easier there by

reducing the length of time that is needed to make the routing decision and improving the overall network performance.

76. **Claim 17** is rejected under 35 U.S.C. 103(a) as being unpatentable over Pegrum et al. and Habetha and Bermer et al. as applied to claim 16 above, and in view of Fedyk et al.

77. Regarding dependent **Claim 17** Pegrum et al. and Habetha do not teach determining the structure of said network from said stored node statuses.

78. In the same field of endeavor, Fedyk et al. teach, in small networks, containing a manageable number of nodes, path selection is accomplished by reference to network topology (structure) information stored at each node in the network. The source node consults its stored network topology information and determines a valid path to the destination node. As the topology of the network is changed, such as by adding or removing nodes, the topology information at each node in the network is updated **(page 1, [0002] lines 3-11)**.

79. It would have been obvious to one of ordinary skill in the art at the time of applicant's invention to combine Pegrum et al. and Habetha and Bermer et al. with

Fedyk et al. since storing the structure or topology information in the nodes is a well-known fact in the art as evident by the background information thought by Fedyk et al.

80. The benefit of having the topology information stored in the nodes of the work is the reduction of the difficulty with trouble shooting the problems in the network.

81. **Claim 18** is rejected under 35 U.S.C. 103(a) as being unpatentable over Pegrum et al. and Habetha and Bermer et al. and Fedyk et al. as applied to claim 17 above, and in view of Mulla.

82. Regarding dependent **Claim 18** Fedyk et al. disclose, determining the structure of said network from said stored node statuses **(page 1, [0002] lines 3-11)**.

83. Regarding dependent **Claim 18** Pegrum et al. and Habetha and Bermer et al. and Fedyk et al. do not teach, said network comprises N nodes: determining a node that is a distance one upstream from a given node by reading the node identification of the node status stored at an address corresponding to an initial message age; and if N>2, determining additional nodes that are distances two through N from said given node by reading the node identifications of the node statuses stored at addresses corresponding to said initial message age that has been aged by one through N-1.

84. In the same field of endeavor, Mulla teaches, the first node is node 0 (ring master) the next downstream node is node1 and the numbers are incremented around the ring in a linear fashion **(col. 7, lines 14-16)**, The ring master knows how many nodes are present by counting the number of increment messages. If Node 0 (ring master) receives N increment messages, then there are N nodes on the network this includes the message that the ring master itself generated. It is simple math that since there are N nodes in the network the nodes distances or hopes 2 to N away from the Node 0 (ring master) would be one through N-1 **(col. 7, lines 17-22)**.

85. It would have been obvious to one of ordinary skill in the art at the time of applicant's invention to combine Pegrum et al. and Habetha and Fedyk et al. with Mulla since knowing the node ID as well as the distance (hops) a node has from another node in the network makes trouble shooting much easier for the network administrator.

86. The benefit of not only knowing the distance of a node from another node as well as knowing the ID of that node is that any node can easily be located and tended to when required.

87. **Claim 19** is rejected under 35 U.S.C. 103(a) as being unpatentable over Pegrum et al. and Habetha and Bermer et al. and Fedyk et al. as applied to claim 17 above, and in view of Watanabe.

88. Regarding dependent **Claim 19**, Fedyk et al. disclose, in small networks, containing a manageable number of nodes, path selection is accomplished by reference to network topology (structure) information stored at each node in the network. The source node consults its stored network topology information and determines a valid path to the destination node. As the topology of the network is changed, such as by adding or removing nodes, the topology information at each node in the network is updated **(page 1, [0002] lines 3-11)**. Bermer et al. disclose storing the node identification of the node status at an address corresponding to an initial message age **(Col. 7, lines 8-12)**.

89. Regarding dependent **Claim 19** Pegrum et al. and Habetha and Bermer et al. and Fedyk et al. do not teach, reading said stored node statuses; identifying an immediately adjacent, first upstream node by the node identification of the node status; identifying any additional upstream nodes by the node identifications of the node statuses stored at addresses corresponding to said initial message age that has been aged by said additional upstream nodes.

90. In the same field of endeavor, Watanabe teaches, a function of detecting and receiving (reading) an adjacent station frame (node status) **(col. 2, line 20-21)**. Watanabe further teaches identifying an immediately adjacent, first upstream node by the node identification of the node status stored at an address corresponding to an initial message age; and identifying any additional upstream nodes by the node

identifications of the node statuses stored at addresses corresponding to said initial message age that has been aged by said additional upstream nodes. **(Fig. 1 and Fig. 2, above).**

91. It would have been obvious to one of ordinary skill in the art at the time of applicant's invention to combine Pegrum et al. and Habetha and Bermer et al. and Fedyk et al. with Watanabe to account for reading the stored information from the memory so as to find the first upstream node as well as identify any additional nodes on the network by their node ID in relation to the hop count parameter of the frame as well as expediting the .

92. The benefit of reading the information stored is that once the stored information is read, calculation can be made based on the content of the memory. Unless the stored information is read, the information content is useless. The benefit of knowing the first upstream node as well as any additional nodes in the network by its node ID in relation to the node count is to facilitate the maintenance of the network.

93. **Claim 20** is rejected under 35 U.S.C. 103(a) as being unpatentable over Pegrum et al. and Habetha and Bermer et al. and Fedyk et al. as applied to claim 17 above, and in view of Mulla and in further view of Watanabe.

94. Regarding dependent **Claim 20** Fedyk et al. disclose, determining the structure of said network from said stored node statuses **(page 1, [0002] lines 3-11)**. Bermer et al. teaches node status stored at an address corresponding to an initial message age as well as node statuses stored at addresses corresponding to initial message age that has been aged by the upstream nodes **(Col. 7, lines 8-12)**

95. Regarding dependent **Claim 20** Pegrum et al. and Habetha and Bermer et al. and Fedyk et al. do not teach, reading said stored node statuses; identifying said network as comprising N nodes where N is the number of node statuses that have been stored and read; identifying an immediately adjacent, first upstream node by the node identification of the node status and if N>2, identifying any additional upstream nodes by the node identifications of the node statuses.

96. In the same field of endeavor, Mulla teaches, the first node is node 0 (ring master) the next downstream node is node1 and the numbers are incremented around the ring in a linear fashion **(col. 7, lines 14-16)**, The ring master knows how many nodes are present by counting the number of increment messages. If Node 0 (ring master) receives N increment messages, then there are N nodes on the network this includes the message that the ring master itself generated. It is simple math that since there are N nodes in the network the nodes distances or hopes 2 to N away from the Node 0 (ring master) would be one through N-1 **(col. 7, lines 17-22)**. Watanabe teaches a function of detecting and receiving (reading) an adjacent station frame (node status) **(col. 2, line 20-21)**. Watanabe further teaches identifying an immediately

adjacent, first upstream node by the node identification of the node status.; and identifying any additional upstream nodes by the node identifications of the node statuses stored at addresses corresponding to said initial message age that has been aged by said additional upstream nodes. **(Fig. 1 and Fig. 2, above).**

97. It would have been obvious to one of ordinary skill in the art at the time of applicant's invention to combine Pegrum et al. and Habetha and Fedyk et al. with Mulla and Watanabe since knowing the node ID as well as the distance (hops) a node has from another node in the network makes trouble shooting much easier for the network administrator.

98. The benefit of not only knowing the distance of a node from another node as well as knowing the ID of that node is that any node can easily be located and tended to when required.

99. **Claim 21-22** are rejected under 35 U.S.C. 103(a) as being unpatentable over Pegrum et al. and Habetha as applied to claim 10 above, and in view of Coden (US. Pat. No. 6389030B1 hereafter referred to as "Coden").

100. Regarding dependent **Claim 21** Pegrum et al. and Habetha do not teach, status messages and corresponding node statuses further include data representative of

operational characteristics of their corresponding nodes, said method further comprising determining the status of said network from said stored node statuses.

101. In the same field of endeavor, Coden teaches, A variety of services can be provided in a network by prepending, including or postpending identifiers or "tags" to status messages (packets transported by the network). For example, services such as virtual local area networks (VLANs), quality of service (QOS) and other services can be implemented through the use of such tags **(Col10, lines 12-17)**

102. It would have been obvious to one of ordinary skill in the art at the time of applicant's invention to combine Pegrum et al. and Habetha with Coden since having additional information included in the status messages sent between nodes is beneficial.

103. The benefit of adding additional information to the status messages is that routing decision would become faster as well as the fact that trouble shooting the network would become much simpler.

104. Regarding dependent **Claim 22** Pegrum et al. and Habetha do not teach, said data representative of the operational characteristics of their corresponding nodes comprises at least one node characteristic selected from the following group: an immediately upstream node identification; status of data transmission; status of data

reception; status of network retransmission; status of network link; redundant link status; and, data valid.

105. In the same field of endeavor, Coden teaches, A variety of services can be provided in a network by prepending, including or postpending identifiers or "tags" to status messages (packets transported by the network). For example, services such as virtual local area networks (VLANs), quality of service (QOS which include parameters such as data transmission & reception, network link and redundant link amongst others], and other services can be implemented through the use of such tags **(Col10, lines 12-17)**

106. It would have been obvious to one of ordinary skill in the art at the time of applicant's invention to combine Pegrum et al. and Habetha with Coden since having additional information included in the status messages sent between nodes is beneficial.

107. The benefit of adding additional information to the status messages is that routing decision would become faster as well as the fact that trouble shooting the network would become much simpler.

Conclusion

108. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Jaber et al. (US PG Pub. No. US 20020006112 A1) teach Method and system for modeling and advertising asymmetric topology of a node in a transport network, Kelly et al. (US Patent No. US 6542469 B1) teach Communications network system and method for routing based on disjoint pairs of path, Pan et al. (US Patent No. US 5535213 A) teach Ring configurator for system interconnection using fully covered rings.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Saeed S. Mirzadegan whose telephone number is 571-270-3044. The examiner can normally be reached on M-F 8:00-5:00.

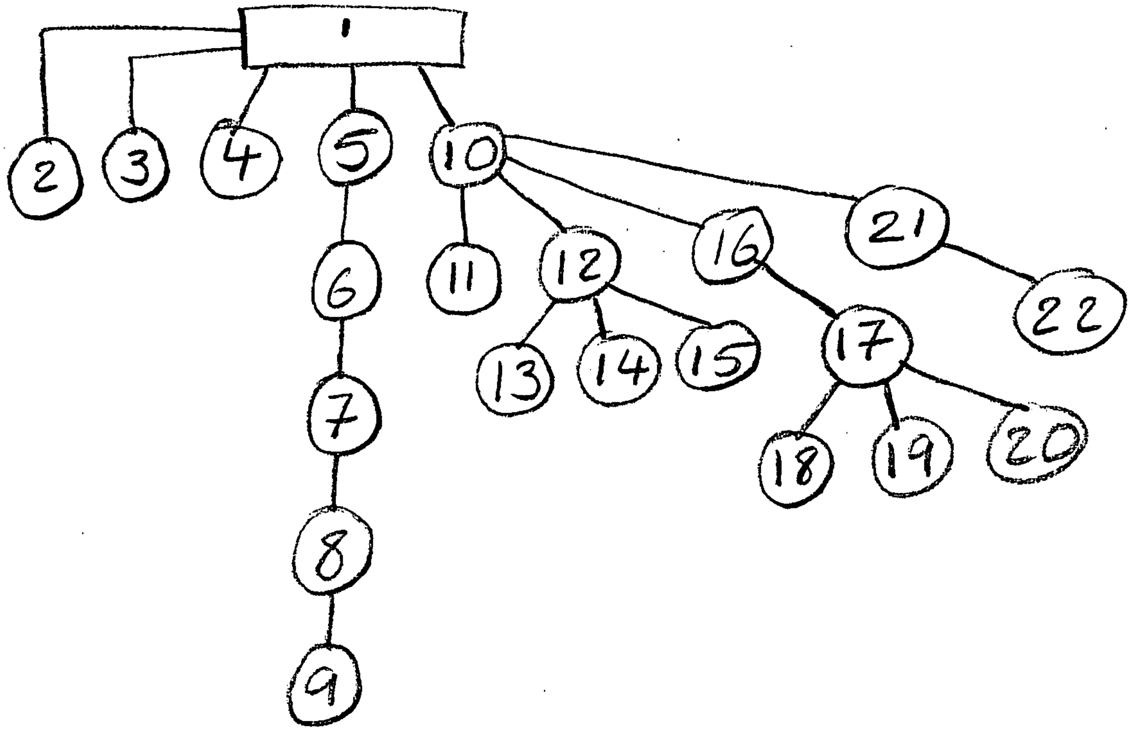
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Assouad can be reached on 571-272-2210. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

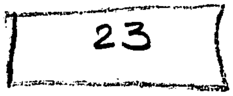
SSM

PATRICK ASSOUAD
SUPERVISORY PATENT EXAMINER

Claim Tree



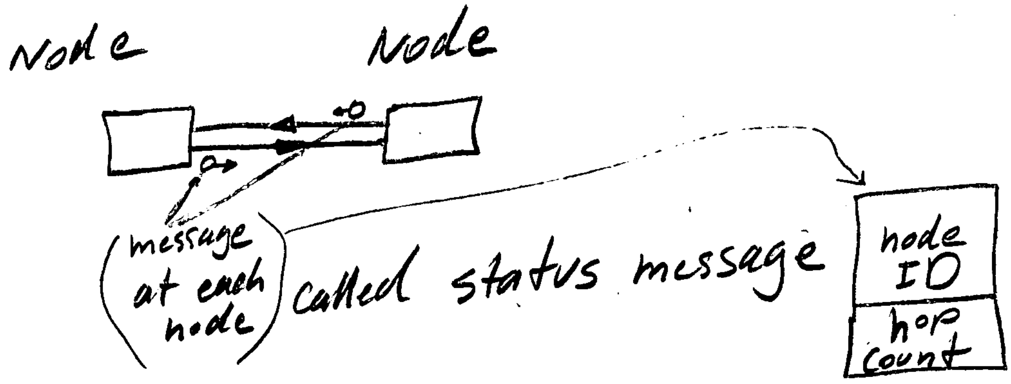
1. A
2. A
3. A
4. A, H
5. A, B
6. A, B
7. A, B
8. A, B, C
9. A, B, C, D, G
10. A, D
11. A, D, B
12. A, D, E
13. A, D, E, C
14. A, D, E, F
15. A, D, E, F, C
16. A, D, G
17. A, D, G, E
18. A, D, G, E, C
19. A, D, G, E, F
20. A, D, G, E, C, F



21. A, D, I
22. A
23. A, F

A. Pegrum et al.
B. Meares et al.
C. Mulla
D. Habetha
E. Fedyk et al.
F. Watanabe
G. Bermer et al.
H. Rosborough
I. Coden

1



- Periodic transmission & Reception at each node
- Incrementing the counter at each node
- Retransmitting Incremented message

2 method of 1
- Period approximately 1 m.sec,

mili second
mili-second
mili ‸ second
mS

3 method of 1
Periodic transmission is automatic

4 method of 1
one of the nodes is a monitor node.
↳ Receives status message & monitors the network using the status message

⑤ method of $\boxed{1}$

node that generated the message (same node ID as the message)

Removes the message from network.

⑥ method of ⑤

the Node count is the same as hop count of the removed messages

⑦ method of ⑥

Calculating size of network from the node count

⑧ method of ⑦

counter = 0 when message is generated, count = adding 1 to counter

network size = node count + 1

⑨ method of ⑧

node statuses (Lack of anticident basis

~~node status~~

store node statuses at each node

at address corresponding to hop count (node count)

⑩ method of ①

store node statuses from status messages at each node.

⑪ method of ⑩

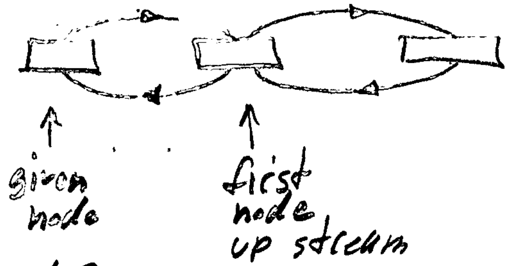
storing node statuses comprises storing a data valid indicator.

⑫ method of ⑩

Determining the structure of the network from stored node statuses.

⑬ method of ⑫

network comprises: N nodes & determining network structure from stored node statuses comprises:



determine the next upstream node by using the node ID of the node status corresponding to initial hop count.

If $\overset{\#nodes}{N} > 2$, the other nodes are (1 to (N-1)) ← using node ID of node statuses with above node or hop count

⑭ method of ⑫

structure of network is determined from stored node statuses

by: - Reading stored node statuses
- identifying next node up stream by node ID from the node status corresponding to an initial message count.

&

- Identifying other upstream nodes by the node ID from the node statuses of Incremented message counts.

⑮ method of ⑫

structure of network is determined from

- Reading stored node statuses
- Identifying number of nodes on the network as N from number of node statuses that have been stored & Read
- identifying immediate adjacent, first upstream node by node ID of the node status corresponding to an initial message count.

&

If $N > 2$, identifying any additional up stream nodes by the node ID of the node statuses corresponding to the initial message that has been incremented.

⑯ method of ⑩

node statuses are stored at each node at the addresses corresponding to hop count of each node status

⑰ method of ⑯

structure of network is determined from stored node statuses.

⑱ method of ⑰

network has N nodes

structure of network is determined from node statuses

: a node a distance one upstream is determined by reading the node ID of the node status stored at the address corresponding to the initial message count.

and

if N>2, additional nodes that are distances 2 through N from the given node are determined by the node ID of the node statuses stored at addresses corresponding to the message count that has been incremented by 1 to N-1

⑲ method of ⑰
network structue is determined from stored node statuses
by: reading the stored node statuses
identifying an immediate adjacent, first upstream node
by the Node ID of the node status stored at an
address corresponding to an initial message count
and
identifying any additional upstream nodes by the
Node ID of the node statuses stored at addresses
corresponding to the initial message count that has been
incremented by the additional upstream nodes.

⑳ method of ⑰
structure of network is determined from stored node statuses
by:
- reading the stored node statuses
- network has N nodes which is the number of node statuses
that have been stored and read.
- First adjacent, upstream node is identified by the
Node ID of the node status stored an the address
corresponding to the initial message count,

and if $N>2$, any additional nodes are identified by the
node ID of the node statuses stored at the address
corresponding to the initial message count that has been
incremented by the additional upstream nodes.

45.

㉑ method of ⑩

status messages & corresponding node statuses further include data representative of operational characteristics of their corresponding nodes.

this method further comprises:

the status of the network is determined from the stored node statuses;

㉒ method of ㉑

Data representative of operational charachteristics of their corresponding nodes comprises: at least one node charachteristic selected from:

1. an immediately up stream node ID
2. status of data transmition
3. status of data reception
4. status of network retransmission
5. status of network link
6. Redundent Link status
7. Data valid

23 a network having a plurality of nodes, each node comprising: . Logic for generating status messege ID/count

- logic for periodic transmition of status messages
- 〃 〃 receiving the 〃 〃
- 〃 〃 incrementing the counter
- 〃 〃 retransmitting the incremented status messages